Week 10: Risk & Risk Risk Management-L2

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Outline

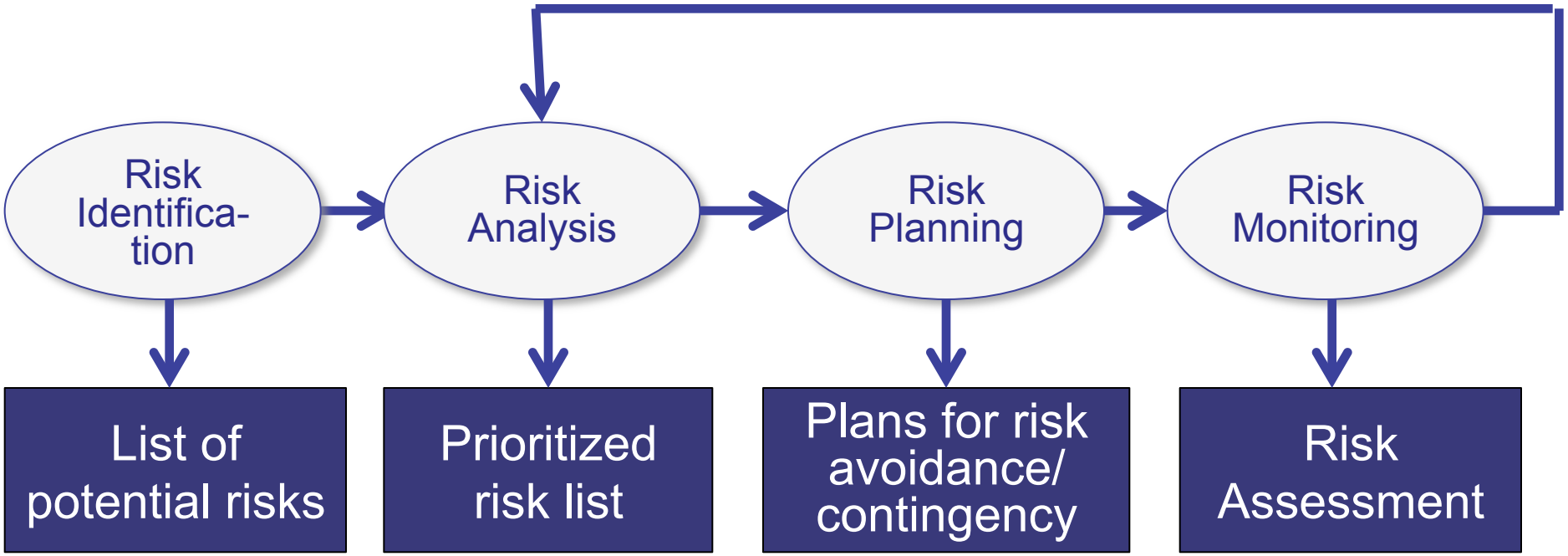
- A bit of a recap
- Some things about the last weeks
- Risk what it is and what to look out for
- Risk processes
- Risk management
- Risk Assessment & Control
- Crisis Management
- Summary

THE RISK MANAGEMENT PROCESS

Risk Management

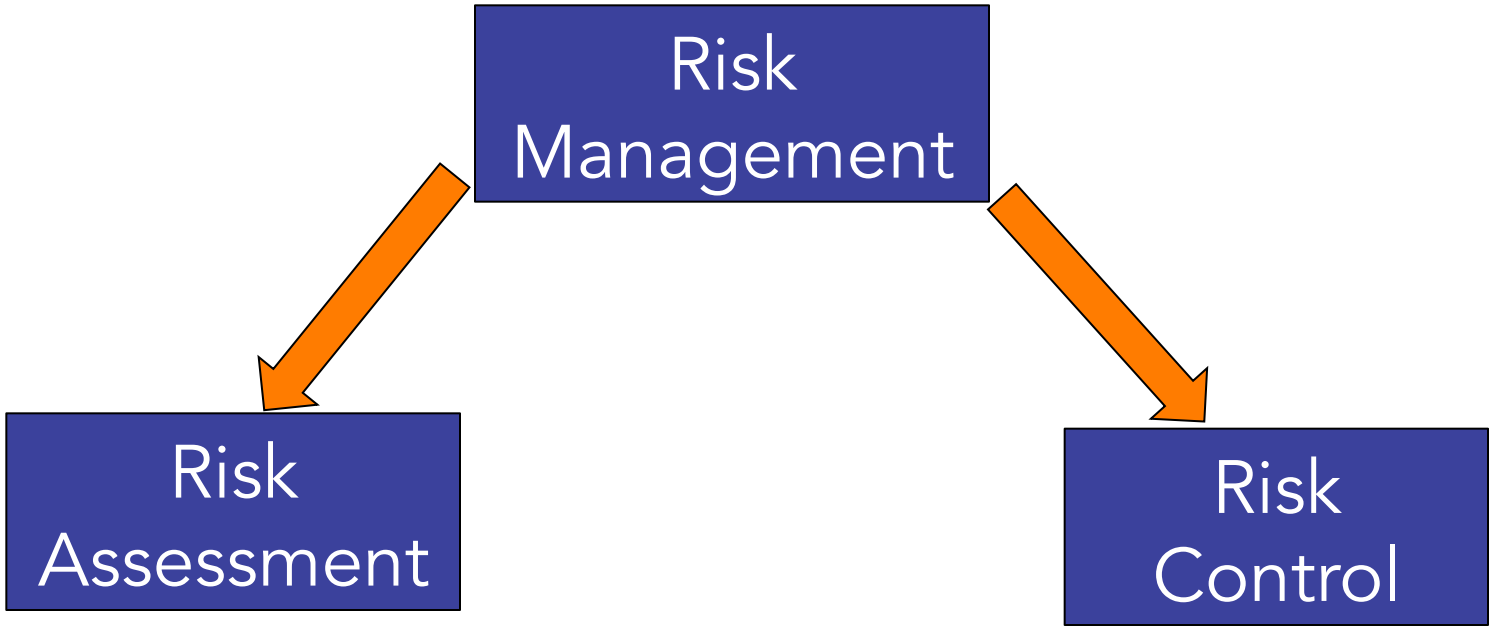
- Important b/c of uncertainties in SW development
- Need to anticipate risk,
- Understand impact of risk on project, product and business
- Take steps to avoid risks
- Draw up contingency plans

Risk Management Process



Risk Management (RM)

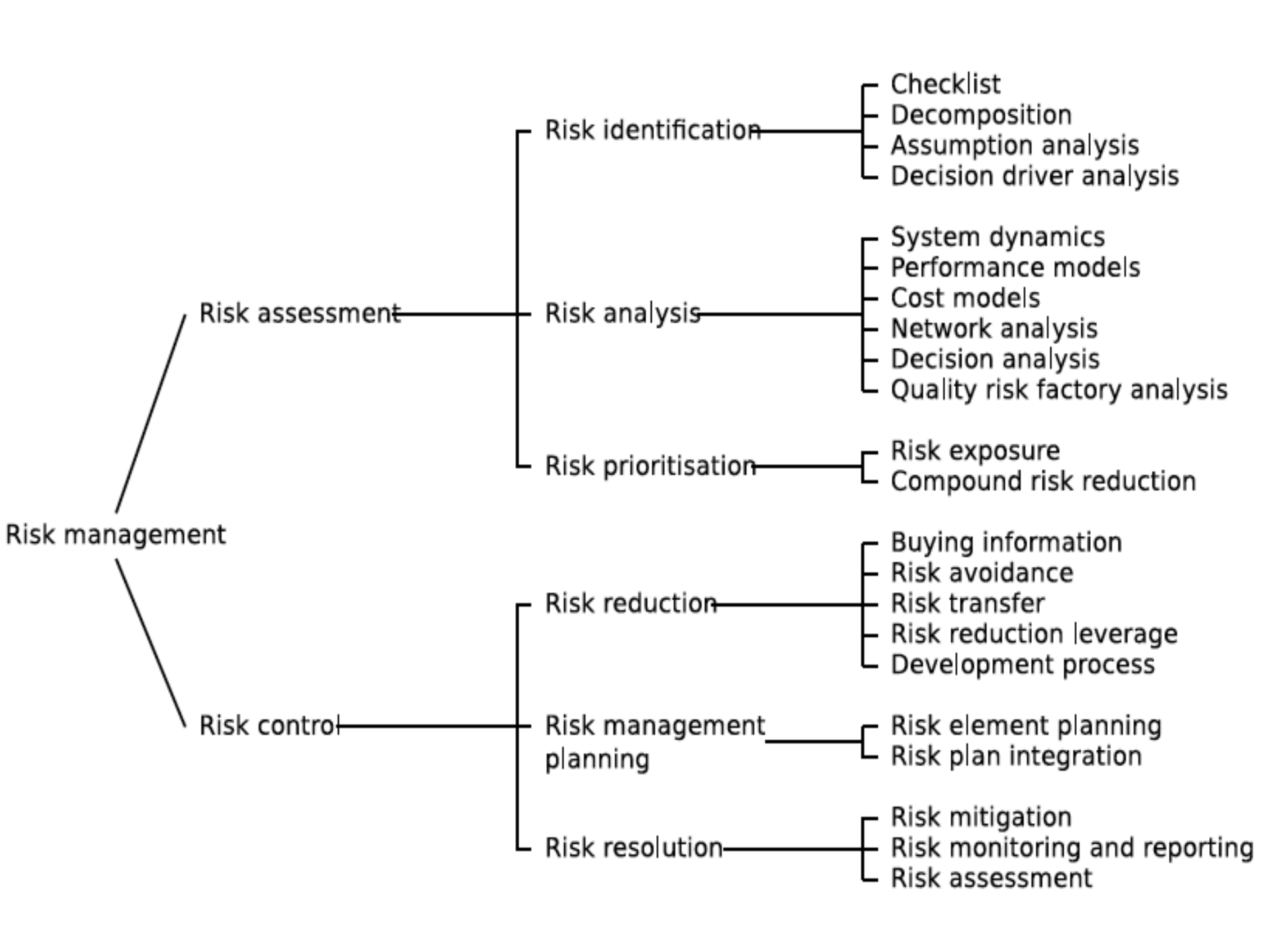
Performing RM



Identify
Analyse and
Prioritize

Remove, mitigate,
accept or minimize
the risks

Identifying Risks


Risk management
Risk assessment
Risk control
Risk identification
Risk analysis
Risk prioritisation
Risk reduction
Risk management planning
Risk resolution
Checklist
Decomposition
Assumption analysis
Decision driver analysis
System dynamics
Performance models
Cost models
Network analysis
Decision analysis
Quality risk factory analysis
Risk exposure
Compound risk reduction
Buying information
Risk avoidance
Risk transfer
Risk reduction leverage
Development process
Risk element planning
Risk plan integration
Risk mitigation
Risk monitoring and reporting
Risk assessment

Risk is everywhere - 1

- All PM is risk management
- Software testing is 'risky'
- SLDC models mitigate risk, localizes to a phase/stage
- *Generic risks*
- Every process in a SE project mitigates risk

Risk is everywhere - 2

- Some risks specific to a project
- E.g using a 3rd party application from a vendor
- *Specific risks*
- Risk Manager role → assess and control risks
- SE process to control risks

Risk identification

Interviews/
surveys/
questionnaires

pondering

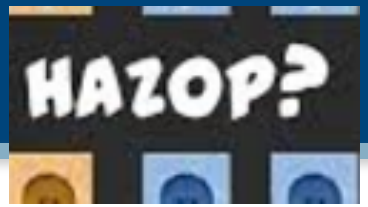
brainstorming

checklist

View on Risk

- Some authors → treat risk assessment as fun.
- Will improve risk management
- Need to avoid risks seen as a bad thing
- Encourage positive thinking
- Opportunities to find risks

HAZOP



HAZOP study – identifies hazards and risks in a process or operation

Combines key driven risk assessment, brainstorming & pondering

HAZOP proceeds with applying a set of *keywords*
To a set of *parameters*

Each keyword a deviation of the design intent
Parameters depend on the domain – "*what if*"

HAZOP guidewords

Guideword	Meaning
NOT	The complete negation of the design intent
MORE	Quantitative increase
LESS	Quantitative decrease
AS WELL AS	Qualitative increase
PART OF	Qualitative decrease
REVERSE	Logical opposite of the design intent
OTHER THAN	Substitution of complete design intent
EARLY	Earlier than expected according to clock time
LATE	Later than expected according to clock time
BEFORE	Earlier than expected according to sequence
AFTER	Later than expected according to sequence

HAZOP study report

Guideword	Meaning
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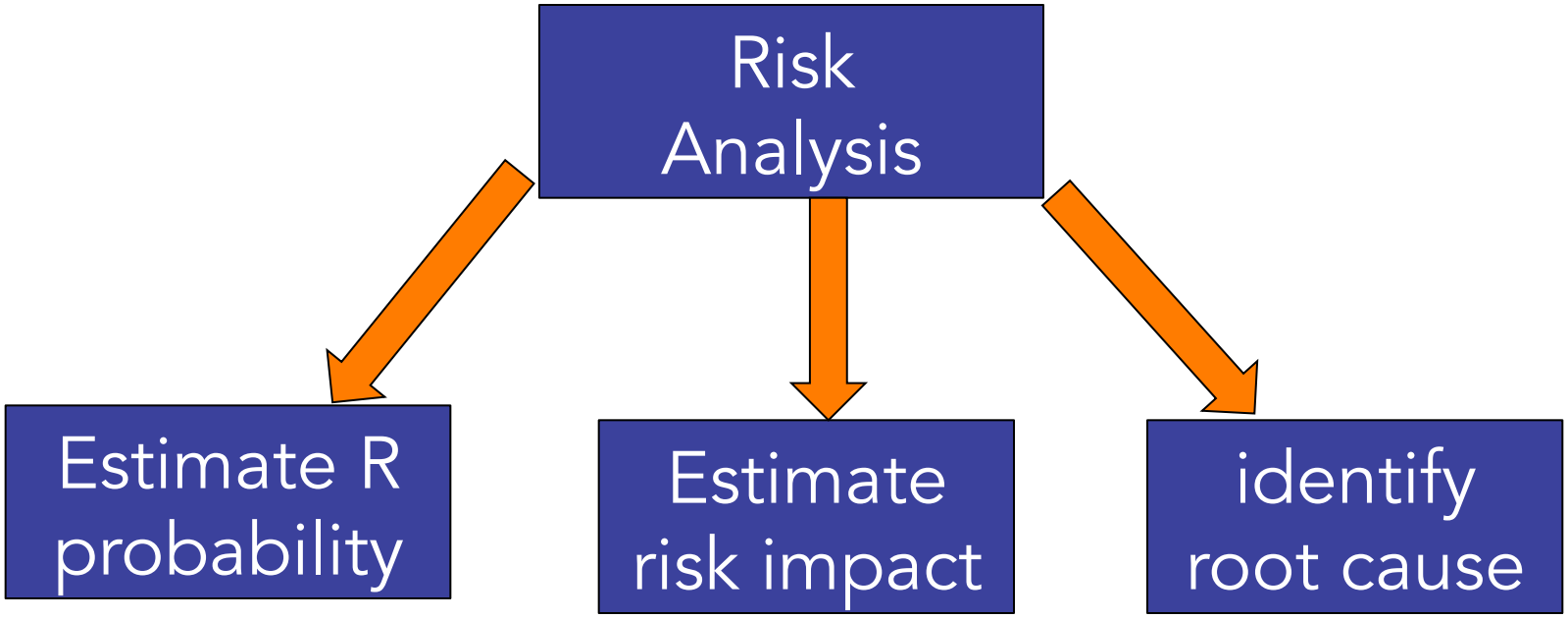
Guideword	Interpretation	Possible Causes	Consequences
MORE	Vendor delivers additional functionality to what was expected.	Additional functionality desired by other users.	A license for the software may cost more than expected.
LESS	Some expected functionality missing.	Misunderstanding of customer base by vendor.Misunderstanding of the vendors intentions by the project team.	Package will not be sufficient for the needs of the project. Additional functionality will need to be developed in house.
OTHER THAN	Package delivers functionality completely inconsistent with expectations.	Misunderstanding of the vendors intentions by the project team.	Another package will need to be sourced or developed in house.
EARLY	Vendor delivers the package prior to expected date.	Vendor is well-organised.	Some activities can be brought forward in the schedule.
LATE	Vendor delivers the package after the expected date.	Inaccurate planning by vendor. Problems may exists with the package.	Some activities will be delayed.

Risks ANALYSIS

Risk Management (RM)



Prioritizing Risk - 1

- Final step is to *prioritize risk*
- Use a quantifiable scale for risk impact
- Gives a total order b/w risks based on
  - ***Risk exposure***
- Risk prioritization is AS EASY as calculating the exposure
- Rank the higher exposure risks as
  - ***Higher priority***

Prioritizing Risk - 2

- Higher priority risks require more attention and control than lower priority
- Make decisions wisely, part of the project

  e.g. $10K loss for one project end in developers loosing jobs and company filing bankrupt but another loss not noticed

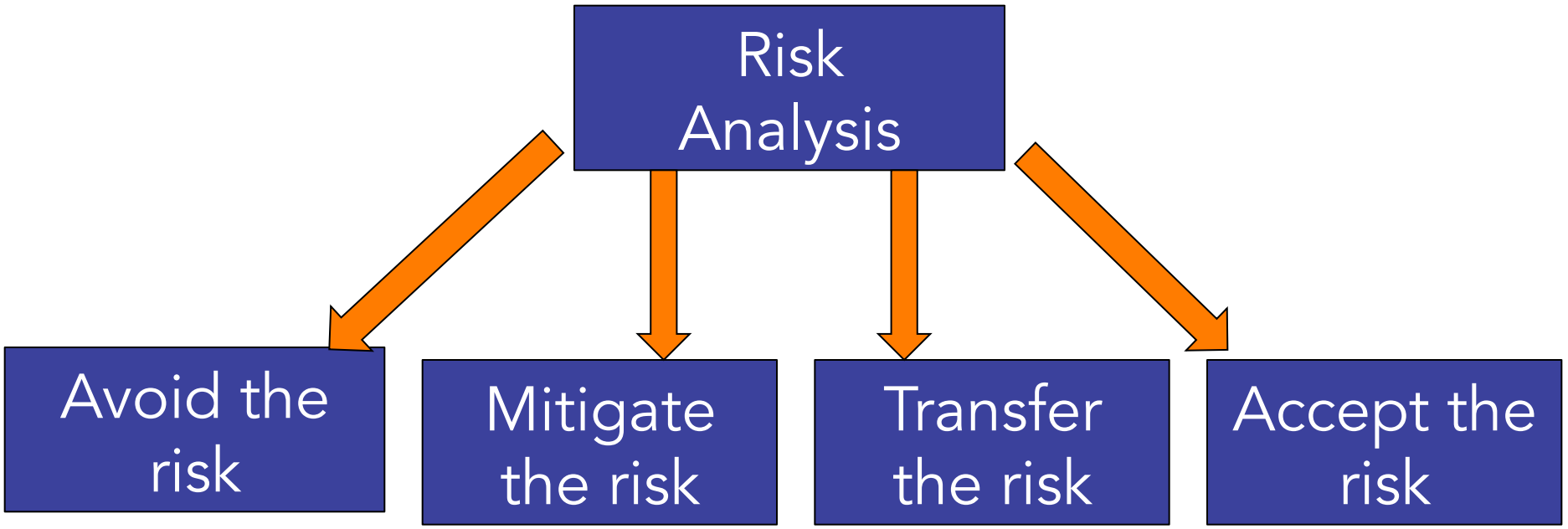
Prioritizing Risk - 3

- Identify risks → then
  - –Classify and
    - place in a risk register/log

- **WHY CLASSIFY ?**

Risk CONTROL

Risk Management (RM)



Prevent risk from occurring, ensure: probability = 0 or impact =0

Employee techn's to reduce probability of risk/ reduce impact of risk= residual risk

Transfer risk burden to another party

Believe risk is an acceptable exposure

Risk reduction leverage

- Used to assess the *effectiveness* or risk control

Risk reduction leverage

=

$$\frac{\text{Initial Risk exposure} - \text{residual risk exp.}}{\text{Cost of Risk reduction}}$$

Risk reduction leverage

- If < 1 then cost of implementing risk is higher than the benefit gained from it so not cost effective enough to implement
- So find a cost effective alternative or risk will have to be accepted
- **higher the risk reduction leverage** the **more cost effective**

Risk reduction leverage-1

- Outcomes based on some estimates:

1) Critical fault is found – need further debugging and development. Est loss is $0.5M
2) Critical fault, but not found. Cost higher Est loss is $5M
3) No critical fault in the system, Loss is $0

(estimate these probabilities)

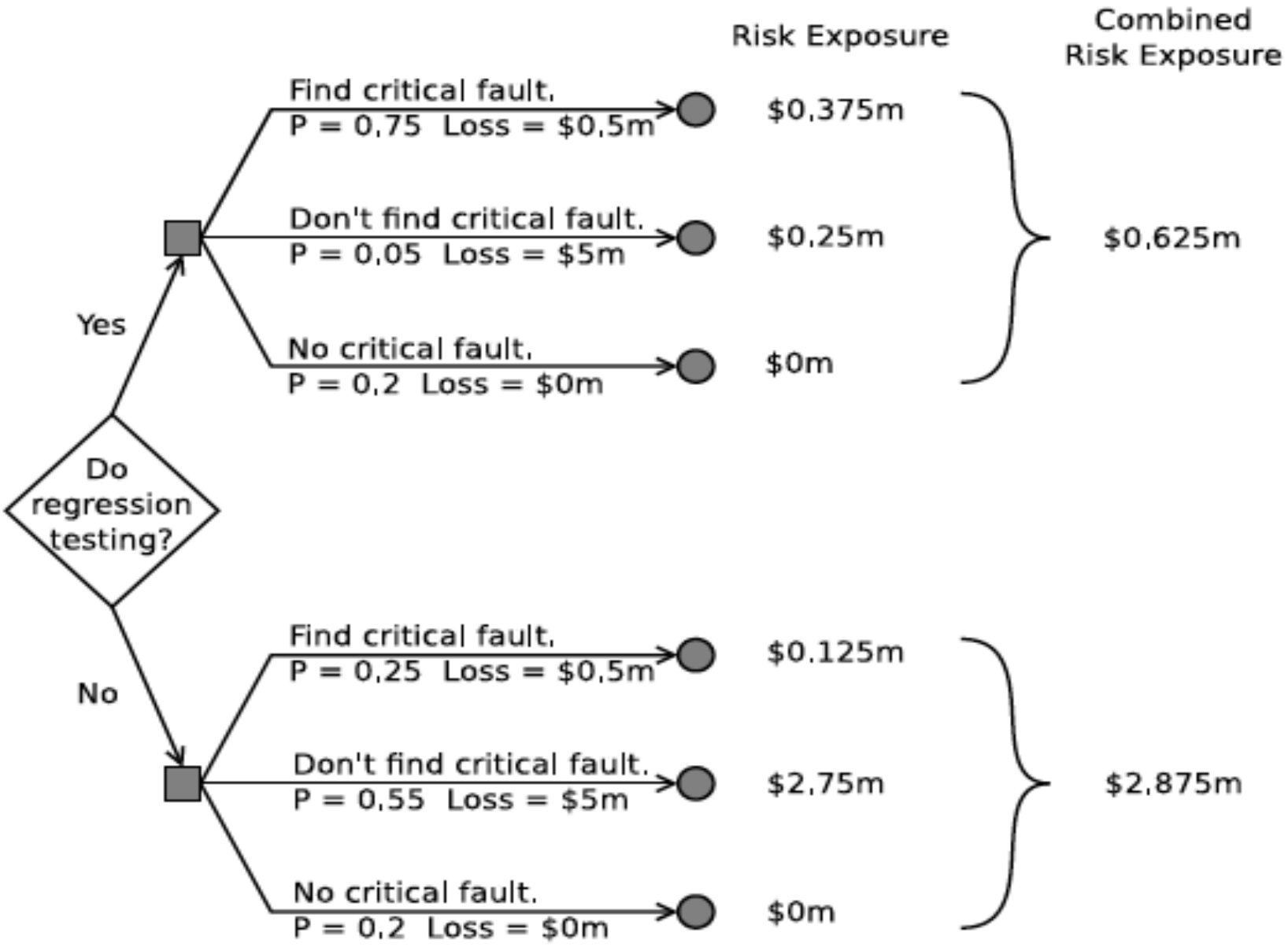
Risk reduction leverage-2

1) Probability no fault = 20%
2) Being a fault and finding it = 75% if doing regression testing but only 25% of not found
3) Critical fault and NOT finding it is 5% if doing regression testing but 55% if we do not
4) Regression testing est. = $1.25M

Risk reduction leverage

- Used to assess the *effectiveness* or risk control

$$\text{Risk reduction leverage} = \frac{\$2.875M - \$0.625M}{\$1.25M} = 1.8$$


Risk Exposure
Combined Risk Exposure
Find critical fault.
P = 0,75 Loss = $0,5m
$0,375m
Don't find critical fault.
P = 0,05 Loss = $5m
$0,25m
$0,625m
Yes
No critical fault.
P = 0,2 Loss = $0m
$0m
Do regression testing?
Find critical fault.
P = 0,25 Loss = $0,5m
$0.125m
No
Don't find critical fault.
P = 0,55 Loss = $5m
$2,75m
$2,875m
No critical fault.
P = 0,2 Loss = $0m
$0m

CRISIS Management

Crisis Management

- Different from Risk Management

Process of dealing with an UNPRECTED event that has a negative impact

1) Positive impact not considered and
2) The event is *unprecited*

QUESTIONS ?

Chapman, C and Ward S (1996) *Project Risk Management: processess, techniques and insights,* John Wiley

Rook P (1993) Risk Management for SW development ESCOM Tutorial, Good Synthesis of Risk Management approaches